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(54) No-rinse hard surface cleaning composition

(57) Compositions for cleaning hard surfaces in a no-rinse mode, said compositions comprising a low boiling solvent (e.g., isopropanol), a high boiling solvent (propyleneglycol monobutyl ether), a fluorinated surfactant, a nonfluorinated surfactant, a fugitive alkaline material and water.

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## SPECIFICATION

## No-rinse hard surface cleaning composition

5 Michael P. Siklosi

## FIELD OF THE INVENTION

The invention pertains to aqueous compositions for cleaning hard surfaces, especially glossy surfaces such as glass and tile. The compositions do not leave a noticeable film on the surface, thereby eliminating the need for rinsing.

10

## BACKGROUND OF THE INVENTION

This invention relates to liquid compositions for cleaning a wide variety of hard surfaces such as metallic, plastic, tile, porcelain, glass and mirrored surfaces. More specifically, this invention relates to a hard surface cleaner which can be used in a no-rinse mode whereby the composition is brought into contact with the surface to be cleaned and then removed therefrom by wiping the surface with a dry cloth.

U.S. Pat. No. 4,302,348, Requejo, issued November 24, 1981, discloses no-rinse compositions for cleaning glossy surfaces. The said compositions comprise an aqueous solution of a primary surfactant such as an alkyl sulfate or an ethoxylated alcohol, a secondary surfactant which is an anionic or nonionic fluorinated hydrocarbon surfactant, a low boiling solvent such as a 2-4 carbon alcohol, a high boiling solvent such as an alkylene glycol or alkylene glycol ether, a fugitive alkaline material such as ammonia and an alkali metal pyrophosphate.

The present invention relates to an improvement over the compositions of Requejo achieved by utilization of a particular high boiling solvent for use in the composition.

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## SUMMARY OF THE INVENTION

**SUMMARY OF THE INVENTION**  
The present invention is directed to aqueous no-rinse hard surface cleaning compositions which contain an anionic or nonionic fluorocarbon surfactant, an anionic, nonionic, amphoteric or zwitterionic nonfluorocarbon surfactant, a 2-4 carbon alcohol, propyleneglycol monobutyl ether, and a fugitive alkaline material, such as ammonia.

## DETAILED DESCRIPTION OF THE INVENTION

In accordance with the present invention, it has been found that improved performance over compositions of the type described in U.S. Pat. 4,302,348 can be achieved by choice of a particular high boiling solvent, propyleneglycol monobutyl ether.

The composition of the present compositions comprise:

(a) from about 1% to about 10% of at least one lower aliphatic monohydric alcohol having a boiling point within the range of from about 75°C to about 100°C;

(b) from about 1% to about 10% propyleneglycol monobutyl ether;

(c) from about 0.08% to about 2.5% of a first surfactant which is a nonfluorinated, nonionic, anionic, amphoteric or zwitterionic surfactant;

(d) from about 0.003% to about 2% of a second surfactant which is a nonionic, anionic or cationic fluorinated hydrocarbon surfactant;

(e) from about 0.1% to about 2% of a fugitive alkaline material; and the balance being water. All proportions and ratios herein are "by weight" unless specified otherwise.

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The antibiotic placebo which are suitable for use in the compositions of

The lower aliphatic alcohols which are suitable for use in the compositions of the present invention contain from 2-4 carbon atoms and having a boiling point within the range

invention are those having from 2-4 carbon atoms and having a boiling point within the range of about 75°C to about 100°C. Examples of these are isopropyl alcohol, n-propyl alcohol, ethyl alcohol, sec-butyl alcohol, tert-butyl alcohol, and mixtures thereof. Lower aliphatic alcohols which do not possess the requisite boiling points are not suitable for use herein in that, those having a boiling point below 75°C tend to evaporate too quickly to impart the desired effects, while those having boiling points in excess of 100°C tend to evaporate too slowly. A particularly suitable lower aliphatic alcohol is isopropyl alcohol which has a boiling point of about 82.3°C.

55 These lower aliphatic alcohols may be present in amounts which vary from about 1% to about 10%. If less than 1% is used the desired effect of this ingredient, the tendency to increase the volatility of the total composition, will not be noticed, while using amounts in excess of about 10% will have a deleterious effect on the performance of the surfactants present. Amounts of this ingredient which are particularly suitable, and therefore preferable for use herein, are from about 2.0% to about 5%.

60 The high boiling solvent used in the present compositions is propyleneglycol monobutyl ether (B.P. 170.2°C). This material provides lubricity for spreading the composition on the surface to be cleaned and also co-acts with the fluorinated hydrocarbon surfactant to increase the detergency performance of the composition and to generate less filming/streaking on surfaces than is the case when other closely related solvents such as ethyleneglycol monobutyl ether are used in 65 the composition. The propyleneglycol monobutyl ether is used in the compositions herein at a

level of from about 1% to about 10%, preferably from about 1.0% to about 2.5%. Propyleneglycol monobutyl ether is available commercially under the name Proposal B<sup>a</sup> from Union Carbide Corporation.

Use of a combination of the organic solvents enumerated above, the alcohol having a relatively low boiling point and the glycol ether having a relatively higher boiling point, is required in compositions of the instant type which are formulated to be used in a no-rinse mode. The combination of solvents in their respective concentrations will provide a sufficiently slow evaporation rate to promote easy spreading without rendering the evaporation rate so slow as to require excessive mopping for removal of these compositions.

5 10 The nonfluorocarbon synthetic detergents for the present compositions can be selected from the anionic, nonionic, amphoteric and zwitterionic types. Such detergents are well known to those skilled in the dexterity art.

10 The most common type of anionic synthetic detergents can be broadly described as the water-soluble salts, particularly the alkali metal salts, of organic sulfuric reaction products having 15 in the molecular structure an alkyl radical containing from about 8 to about 22 carbon atoms and a radical selected from the group consisting of sulfonic acid and sulfuric acid ester radicals. Important examples of these synthetic detergents are the sodium, ammonium or potassium alkyl sulfates, especially those obtained by sulfating the higher alcohols produced by reducing the glycerides of tallow or coconut oil; sodium or potassium alkyl benzene sulfonates, in which the 20 alkyl group contains from about 9 to about 15 carbon atoms, especially those of the types described in U.S. Pat. Nos. 2,220,099 and 2,477,383, incorporated herein by reference; sodium alkyl glyceryl ether sulfonates, especially those ethers of the higher alcohols derived from tallow and coconut oil; sodium coconut oil fatty acid monoglyceride sulfates and sulfonates; sodium or potassium salts of sulfuric acid esters of the reaction product of one mole of a higher fatty 25 alcohol (e.g., tallow or coconut oil alcohols) and about three moles of ethylene oxide; sodium, potassium or ammonium salts of alkyl phenol ethylene oxide ether sulfates with about four units of ethylene oxide per molecule and in which the alkyl radicals contain about 9 carbon atoms; the reaction product of fatty acids esterified with isethionic acid and neutralized with sodium hydroxide where, for example, the fatty acids are derived from coconut oil; sodium or potassium salts 30 of the fatty acid amide of a methyl taurine in which the fatty acids, for example, are derived from coconut oil; and others known in the art, a number being specifically set forth in U.S. Pat. Nos. 2,486,921, 2,486,922 and 2,396,278, incorporated herein by reference.

35 Nonionic synthetic detergents comprise a class of compounds which may be broadly defined as compounds produced by the condensation of alkylene oxide groups (hydrophilic in nature) with an organic hydrophobic compound, which may be aliphatic or alkyl aromatic in nature. The length of the hydrophilic or polyoxyalkylene radical which is condensed with any particular hydrophobic group can be readily adjusted to yield a water-soluble compound having the desired degree of balance between hydrophilic and hydrophobic elements.

40 For example, a well-known class of nonionic synthetic detergents is made available on the market under the trade name of "Pluronic." These compounds are formed by condensing ethylene oxide with an hydrophobic base formed by the condensation of propylene oxide with propylene glycol. The hydrophobic portion of the molecule which, of course, exhibits water-insolubility has a molecular weight of from about 1500 to 1800. The addition of polyoxyethylene radicals to this hydrophobic portion tends to increase the water-solubility of the molecule as a 45 whole and the liquid character of the products is retained up to the point where polyoxyethylene content is about 50% of the total weight of the condensation product.

45 Other suitable nonionic synthetic detergents include:

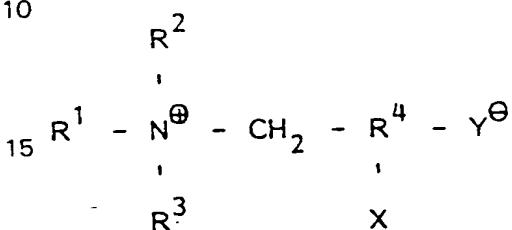
50 (i) The polyethylene oxide condensates of alkyl phenols, e.g., the condensation products of alkyl phenols having an alkyl group containing from about 5 to 12 carbon atoms in either a straight chain or branched chain configuration, with ethylene oxide, the said ethylene oxide being present in amounts equal to 10 to 25 moles of ethylene oxide per mole of alkyl phenol. The alkyl substituent in such compounds may be derived from polymerized propylene, diisobutylene, octane, or nonane, for example.

55 (ii) Those derived from the condensation of ethylene oxide with the product resulting from the reaction of propylene oxide and ethylene diamine—products which may be varied in composition depending upon the balance between the hydrophobic and hydrophilic elements which is desired. Examples are compounds containing from about 40% to about 80% polyoxyethylene by weight and having a molecular weight of from about 5000 to about 11,000 resulting from the reaction of ethylene oxide groups with a hydrophobic base constituted of the reaction product of 60 ethylene diamine and excess propylene oxide, said base having a molecular weight of the order of 2500 to 3000, are satisfactory.

65 (iii) The condensation product of aliphatic alcohols having from 8 to 18 carbon atoms, in either straight chain or branched chain configuration, with ethylene oxide, e.g., a coconut alcohol ethylene oxide condensate having from 10 to 30 moles of ethylene oxide per mole of coconut alcohol, the coconut alcohol fraction having from 10 to 14 carbon atoms.

(iv) Trialkyl amine oxides and trialkyl phosphine oxides wherein one alkyl group ranges from 10 to 18 carbon atoms and two alkyl groups range from 1 to 3 carbon atoms; the alkyl groups can contain hydroxy substituents; specific examples are dodecyl di(2-hydroxyethyl) amine oxide and tetradecyl dimethyl phosphine oxide.

5 Zwitterionic detergents comprise the betaine and betaine-like detergents wherein the molecule contains both basic and acidic groups which form an inner salt giving the molecule both cationic and anionic hydrophilic groups over a broad range of pH values. Some common examples of these detergents are described in U.S. Pat. Nos. 2,082,275, 2,702,279 and 2,255,082, incorporated herein by reference. Suitable zwitterionic detergent compounds have the formula



20 wherein R<sup>1</sup> is an alkyl radical containing from about 8 to about 22 carbon atoms, R<sup>2</sup> and R<sup>3</sup> contain from 1 to about 3 carbon atoms, R<sup>4</sup> is an alkylene chain containing from 1 to about 3 carbon atoms, X is selected from the group consisting of hydrogen and a hydroxyl radical, Y is selected from the group consisting of carboxyl and sulfonyl radicals and wherein the sum of the R<sup>1</sup>, R<sup>2</sup> and R<sup>3</sup> radicals is from about 14 to about 24 carbon atoms.

25 Amphoteric detergents which can be either cationic or anionic depending upon the pH of the system are represented by detergents such as dodecyl-beta-alanine, N-alkyltaurines such as the one prepared by reacting dodecylamine with sodium isethionate according to the teaching of U.S. Pat. No. 2,658,072, N-higher alkylaspartic acids such as those produced according to the teaching of U.S. Pat. No. 2,438,091, and the products sold under the trade name "Miranol," 30 and described in U.S. Pat. No. 2,528,378, said patents being incorporated herein by reference.

Additional synthetic detergents and listings of their commercial sources can be found in *McCutcheon's Detergents and Emulsifiers*, North American Ed. 1980, incorporated herein by reference.

Preferred surfactants for use as the nonfluorinated surfactants herein are selected from the group of linear primary alcohol ethoxylates, such as the reaction product of a linear primary alcohol having from about 10 to about 14 carbon atoms reacted with an average of from about 2 to about 6 moles of ethylene oxide; the alkyl aryl sulfonates having from about 11 to about 13 carbon atoms in the alkyl chain; sulfates of  $C_{10}$  to  $C_{14}$  fatty alcohols, e.g., sodium lauryl sulfate;  $C_8$  to  $C_{12}$  alkyl phenoxy polyethoxy ethanol e.g., octyl phenol condensed with 3 to 10 moles of ethylene oxide. A particularly preferred surfactant for use as the nonfluorinated surfactant is sodium lauryl sulfate.

The amount of nonfluorinated surfactant present in the instant compositions can vary from about 0.08% to about 2.5%. A particularly suitable amount for use herein is from about 0.1% to about 0.3%.

45 Fluorinated hydrocarbon surfactants are structurally analogous to nonfluorinated surfactants described above.

In the fluorinated hydrocarbon surfactants some or all of the hydrogen atoms in the surfactant hydrocarbon chain are replaced with fluorine atoms.

Many examples of fluorocarbon surfactants are known to the art. The following are given by way of illustration:

(a) Anionics  
 $R_2CH_2CH_2SCH_2CO_2M$  wherein R<sub>2</sub> is  $CF_3CF_2$ , wherein n is from about 3 to about 8 and M is

alkali metal (e.g., sodium or potassium or ammonium.  $C_nF_{2n+1}CO_2M$  wherein  $C_nF_{2n+1}$  is a straight chain fluorocarbon radical, M is an alkali metal or ammonium and n is from about 4 to about 12.  $C_8F_{17}CO_2M$  is a straight chain fluorocarbon radical, n is from about 8 to about 12.

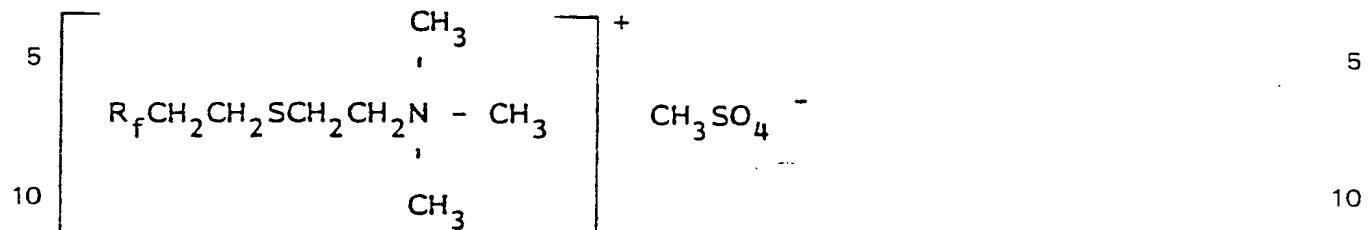
$C_nF_{2n-1}SO_3M$  wherein  $C_nF_{2n-1}$  is a straight chain fluorocarbon radical, n is from about 8 to 12 and M is alkali metal or ammonium.

60 (b) Nonionics  
 $R_fCH_2CH_2O(CH_2CH_2O)_nH$  wherein  $R_f$  is a straight chain  $F(CF_2CF_2)_n$  radical, wherein  $n$  is from about 3 to about 8.

$R_1(OCH_2CH_2)_nOR_1$ , wherein  $R_1$  is a branched chain radical of the formula  $C_6F_{13}$ ,  $C_6H_{12}$  or  $C_6Cl_{12}$  and  $n$  is from about 10 to about 30.

65  $R_1(OCH_2CH_2)_mOR$  wherein  $R_1$  is a branched chain radical of the formula  $C_6F_{13}$ ,  $C_6H_{13}$  or  $C_6F_{11}CH_3$  to

is from about 2 to about 20 and R is C<sub>1</sub> to C<sub>3</sub> alkyl.  
(c) Cationic



wherein R<sub>f</sub> is F(CF<sub>2</sub>CF<sub>2</sub>)<sub>n</sub> in which n is 3 to 8.

Fluorinated hydrocarbon surfactants are available from numerous commercial sources as trade-marked products. Examples are ZONYL® Fluorosurfactants from E. I. duPont de Nemours & Co., FLUORAD® Fluorochemical Surfactants from 3M Company, e.g., FLUORAD FC129, and MONO-FLOR® fluorocarbon surfactants from I.C.I., Ltd.

Particularly preferred fluorinated hydrocarbon surfactants for use herein are those of the formula C<sub>n</sub>F<sub>2n+1</sub>CO<sub>2</sub>M wherein n is from about 6 to about 12, most preferably about 8.

20 These fluorinated hydrocarbon surfactants can be present in the instant invention in amounts which range from about 0.003% to about 2%. Using amounts of less than 0.003% will not provide the detergency necessary while using amounts in excess of 2% will increase the level of nonvolatile ingredients such that smearing will occur. Additionally increasing the levels of this ingredient to above 2% will not appreciably increase the detergency of the resultant compositions. A particularly suitable amount of the fluorinated hydrocarbon surfactant is from about 0.01% to about 0.08%.

25 Fugitive alkaline materials are used in the compositions herein for their ability to improve detergency without increasing the level of nonvolatile ingredients, since these materials will evaporate from the surface being cleaned. Examples of suitable fugitive alkaline materials are 30 ammonia and morpholine. The amount of fugitive alkaline material which is useful herein can vary from about 0.05% to about 2%. Using less than about 0.05% will affect the ability of the formulation to remove greasy soils while using more than about 2% will result in the liberation of gases, which create an offensive odor. Although morpholine can be used herein it is preferable to use ammonia. When ammonia is used it may be conveniently added in the form of 35 ammonium hydroxide, ammonium acetate and ammonium carbonate, however, if so added it should be added in quantities capable of producing suitable amounts of ammonia. A particularly suitable amount of the fugitive alkaline material for use herein is from about 0.1% to about 1%.

40 The last of the essential ingredients is water which will make up the balance of the composition. In order to achieve a composition with a low concentration of nonvolatile ingredients, it 45 has been found that the aqueous component should preferably be made up of deionized or soft water.

45 Optionally, alkali metal pyrophosphates or other chelating agents such as nitrilotriacetic acid or ethylenediaminetetraacetic acid may be included in the compositions herein at levels of from 50 materials are nonvolatile, their use in the compositions entails some sacrifice in freedom from filming and streaking on glossy surfaces.

55 Other optional ingredients include perfumes and dyes. The compositions can be made by mixing the various ingredients in any of the suitable amounts previously set forth herein. In use, the compositions are applied to a surface in any 50 conventional manner such as spraying, pouring, etc. After being left in contact with the surface the composition is removed by wiping the surface with a clean, dry, absorbent material. After removal of the composition, the surface is clean and requires no rinse. Due to the high content of volatile ingredients in the instant compositions, no film or residue is left on the surface. Thus the natural gloss of the surface is retained. Also, tendency for resoiling is reduced since there is virtually no residue for airborne dust, etc., to adhere to.

55 The invention will be illustrated by the following examples.

**EXAMPLE 1**

60 A composition of the invention (A) and a similar composition in which propyleneglycol mono-butyl ether was replaced by ethyleneglycol ether were prepared according to the following formulas:

TABLE 1

		<u>% By Weight</u>	
		<u>A</u>	<u>B</u>
5	Na lauryl sulfate	0.1	0.1
10	Fluorinated hydrocarbon surfactant (100% active basis)*	0.01	0.01
15	NH <sub>4</sub> OH (calculated as NH <sub>3</sub> )	0.17	0.17
20	Isopropanol	4.0	4.0
25	Propyleneglycol monobutyl ether	1.75	-
30	Ethyleneglycol monobutyl ether	-	1.75
35	Distilled water	Balance	Balance

40 50% solution of C<sub>n</sub>F<sub>2n+1</sub>CO<sub>2</sub>K in ethanol, 2-butoxyethanol and water, wherein n is primarily 8. 20  
The compositions were tested for filming/streaking on a mirror surface and for cleaning performance on greasy soil according to the following test methods.

*Filming/Streaking Test Method*

45 Clean 30.5 by 30.5 cm mirrors were divided into three 7.6 by 30.5 cm sections with tape. 25  
Exactly 0.8 ml of cleaner solution was applied via syringe up and down one section of mirror. A single paper towel, folded three times, was stroked with light, even pressure across the surface four times. The paper towel was not lifted from the surface between strokes. The thin, even film of solution left on the surface was allowed to dry at ambient conditions, after which the 50 surface was examined visually for filming and streaking. Three replicates were done for each solution in a given test. 30

*Greasy Soil Removal Test Method*

55 A light, even coating of tough greasy soil (a combination of various greases and particulates), 35 like that typically found in the kitchen, was applied on clean 7.6 by 34.1 cooking range splash plates, using a 0.6 cm nap paint roller, and cured by heating in an oven for 3 hours at 140°C followed by storage at room temperature for at least 24 hours. A measured quantity (0.4 ml) of the composition was applied via syringe and lightly spread with a finger over the cleaning area (approx. 7.6 cm by 5 cm). The area was cleaned using a Gardner straight line washability 40 machine, using four strokes. Percent removal of soil was then estimated by visual observation. Three replicates were done for each composition. 40

55 Results were as follows:

TABLE 2Filming/Streaking Intensity

	<u>Composition</u>	<u>Replicate</u>		<u>Extremely light - hardly visible</u>
		<u>A</u>	<u>1</u>	
50	A	2	Clear	
55	A	3	Very light	
60	B	1	Light	
	B	2	Very light	
	B	3	Light - moderate	

TABLE 3

Greasy Soil Cleaning - % Removal

5	Composition	Replicate		5
		1	80	
10	A	2	80	
	A	3	65	
15	B	1	65	15
	B	2	65	
	B	3	65	

From these results it is seen that the composition of the invention, containing propyleneglycol monobutyl ether is superior in cleaning performance and has a reduced tendency to cause 20 filming/streaking on glossy surfaces, compared to a similar composition containing ethyleneglycol monobutyl ether as the high boiling solvent. 20

**EXAMPLE II**

A composition of the invention was prepared in the following manner:

25 236.85 lbs. (107.7 kg) distilled water, 0.75 lbs. (0.34 kg), 28% ammonium hydroxide and 0.025 lbs. (0.011 kg) of the 50% active fluorinated hydrocarbon surfactant of Example 1 were blended together in a mixing vessel. The following ingredients were then blended together in a separate vessel: 7.5 lbs. (3.4 kg) isopropanol, 4.37 lbs. (1.98 kg) propyleneglycol monobutyl ether, 0.25 lbs. (0.11 kg) Igepal CO-710 nonionic surfactant and 0.25 lbs. (0.11 kg) perfume. 30

The mixture from the second vessel was then mixed into the contents of the first vessel.

The finished composition had the following formula:

TABLE 4

35		<u>% By Weight</u>		35
	Isopropanol		3.0	
	Propyleneglycol monobutyl ether		1.75	
40	Fluorinated hydrocarbon surfactant		0.005	40
	NH <sub>4</sub> OH (calculated as NH <sub>3</sub> )		0.08	
	Igepal CO-710*		0.1	
45	Perfume		0.1	45
	Water		<u>94.96</u>	
			<u>100.00</u>	

50 \* Nonylphenol condensed with 10-11 moles ethylene oxide per mole of nonylphenol. 50

**CLAIMS**

1. A cleaning composition for hard surfaces consisting essentially by weight of:
  - (a) from about 1% to about 10% of at least one organic solvent which is a lower aliphatic monohydric alcohol having from about 2 to about 4 carbon atoms and having a boiling point within the range of from about 75°C to about 100°C;
  - (b) from about 1% to about 10% propyleneglycol monobutyl ether;
  - (c) from about 0.08% to about 2.5% of a first surfactant selected from the group consisting of nonfluorinated anionic, nonionic, amphoteric, ampholytic and zwitterionic surfactants;
  - (d) from about 0.003% to about 2% of a second surfactant which is an anionic, nonionic or cationic fluorinated hydrocarbon surfactant;
  - (e) from about 0.05% to about 2% of a fugitive alkaline material which can be ammonia, or morpholine; and
  - (f) the balance of said composition being water.
2. The composition of Claim 1 wherein Component (a) is present at from about 2.0% to 65

about 5%, Component (b) is present at from about 1.0% to about 2.5%, Component (c) is present at from about 0.1% to about 0.3%, Component (d) is present at from about 0.01% to about 0.08% and Component (e) is present at from about 0.1% to about 1%.

3. The composition of Claim 2 wherein Component (c) is selected from the group consisting of ethoxylates of linear primary alcohols containing from about 10 to about 14 carbon atoms in the alkyl chain, alkaryl sulfonates containing from about 11 to about 13 carbon atoms in the alkyl chain, sulfates of  $C_{10}$  to  $C_{14}$  fatty alcohols, and phenoxy polyethoxy ethanol. 5

4. The composition of Claims 1 to 3 wherein Component (d) is selected from the group consisting of:

10 i  $C_nF_{2n+1}CO_2M$  wherein  $C_nF_{2n+1}$  is a straight chain fluorocarbon radical, n is from about 8 to about 12 and wherein M is an alkali metal or ammonium;

ii  $R_fCH_2CH_2SCH_2CO_2M$  wherein  $R_f$  is  $F(CF_2CF_2)_n$  in which n is from about 3 to about 8 and wherein M alkali metal or ammonium;

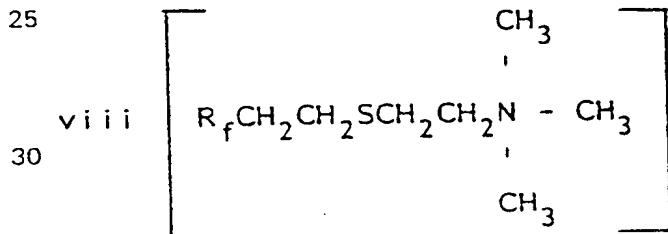
15 iii  $C_nF_{2n+1}SO_3M$  wherein  $C_nF_{2n+1}$  is a straight chain fluorocarbon radical in which n is from about 8 to about 12 and wherein M is alkali metal or ammonium;

iv  $C_nF_{2n-1}OC_8H_4SO_3M$  in which  $C_nF_{2n-1}$  is a branched chain fluorocarbon radical and wherein M is alkali metal or ammonium;

20 v  $R_fCH_2CH_2O(CH_2CH_2O)_nH$  wherein  $R_f$  is a  $F(CF_2CF_2)_n$  radical, wherein n is from about 3 to about 8;

vi  $R_f(OCH_2CH_2)_nOR_f$  wherein  $R_f$  is a branched chain radical of the formula  $C_9F_{15}$ ,  $C_{10}H_{19}$  or  $C_{12}F_{23}$  and n is from about 10 to about 30;

25 vii  $R_f(OCH_2CH_2)_mOR_f$  wherein  $R_f$  is a branched chain radical of the formula  $C_9F_{15}$ ,  $C_{10}H_{19}$  or  $C_{12}F_{23}$ , m is from about 2 to about 20 and R is  $C_1$  to  $C_3$  alkyl; and



30 35 wherein  $R_f$  is  $F(CF_2CF_2)_n$  in which n is from about 3 to about 8.

5. The composition of Claim 4 wherein Component (d) is a fluorinated hydrocarbon surfactant of the formula  $C_nF_{2n+1}CO_2M$  wherein n is from about 6 to about 12 and M is alkali metal or ammonium and herein Component (c) is the sulfate of a  $C_{10}$  to  $C_{14}$  fatty alcohol.

6. The composition of Claim 5 wherein Component (a) is isopropanol and Component (e) is ammonia.

40 40 7. The composition of Claim 4 wherein Component (d) is a fluorinated hydrocarbon surfactant of the formula  $C_nF_{2n+1}CO_2M$  wherein n is from about 6 to about 12 and M is alkali metal or ammonium and wherein Component (c) is a  $C_9$  to  $C_{12}$  alkyl phenoxy polyethoxy ethanol.

8. The composition of Claim 7 wherein Component (a) is isopropanol and Component (e) is ammonia.